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Ralph E. Beedle

SENIOR VICE PRESIDENT AND  
CHIEF NUCLEAR OFFICER,  
NUCLEAR GENERATION

February 14, 2000

Mr. David L. Meyer  
Chief, Rules and Directives Branch  
Division of Administrative Services  
Office of Administration  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

DOCKET NUMBER

PETITION RULE PRM 26-2  
(64FR67202)

SUBJECT: Petition for Rulemaking; Request for Comments on Working Hour  
Limits (64 *Fed. Reg.* 67202; December 1, 1999)

Dear Mr. Meyer:

On behalf of the nuclear energy industry, the Nuclear Energy Institute<sup>1</sup> submits the attached comments in response to the *Federal Register* notice published December 1, 1999 (64 *Fed. Reg.* 67202) on a petition for rulemaking on working hour limits. The petition requests that the NRC (1) add working hour limits to 10 CFR Part 26; (2) add a criterion to 10 CFR 55.33(a)(1) to require evaluation of known sleeping disorders; (3) revise the Enforcement Policy to include examples of working hour violations warranting various NRC sanctions; and (4) revise NRC form 396 to include self-disclosure of sleeping disorders by licensed operators. The petition also requests changes to the NRC inspection procedure for the fitness for duty program.<sup>2</sup> The industry believes the petition for rulemaking should be denied for four primary reasons.

First, the industry has appropriately responded to potential fatigue-related issues. Each licensee has developed programs to comply with NRC fitness-for-duty requirements (including the Continuous Behavioral Observation Program), as well as to implement Generic Letter 82-12, "Nuclear Power Plant Staff Working Hours." These programs successfully demonstrate that licensees recognize that appropriate management of their workforces, including oversight of personnel hours worked, is a fundamental aspect of safe plant operation.

<sup>1</sup> NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, nuclear materials licensees, and other organizations and individuals involved in the nuclear energy industry.

<sup>2</sup> 64 *Fed. Reg.* 67202.

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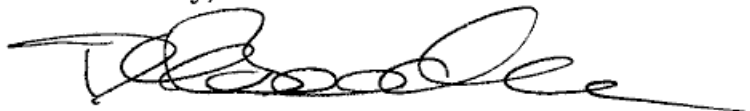
Second, despite the petitioner's contention that "fatigue most probably played a role in a respectable percentage"<sup>3</sup> of incidents recorded in the NRC's Human Factors Information System, the petition does not, and probably cannot, substantiate that conclusion. Simply stated, the petition fails to supply credible data demonstrating an industrywide problem with nuclear plant personnel fatigue. Indeed, data on industry performance demonstrate exactly the opposite proposition—industry performance has improved over the past decade and has done so notwithstanding corporate restructurings affecting nuclear power plant licensees.

Third, additional regulation is not necessary to provide NRC with authority to take action on fatigue-related issues.

Finally, in promulgating any regulation, the NRC must comply with 10 CFR 50.109. To meet the criteria for a "backfit," a proposed rule must demonstrate that the proposed working hour limitations either (1) are necessary for adequate protection or (2) will achieve a substantial increase in the overall protection of public health and safety, *and* the direct and indirect costs of implementation are justified in view of the increased protection. Without showing that fatigue is a root cause of, or even a substantial contributing factor to, the limited number of significant events that have occurred over the past decade, the adequate protection test of the backfit rule is not met. Further, given the complexity of the proposal and the burdensome nature of its implementation for licensees and enforcement by the agency, we do not believe the proposed rule meets the cost-benefit test of 10 CFR 50.109.

Thus, as stated above, the industry does not believe further agency action is appropriate and we strongly encourage the NRC to deny this petition. Please do not hesitate to contact me or Jim Davis (202-739-8105) if you have questions regarding the industry's position on this rulemaking.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Beedle", with a long horizontal flourish extending to the right.

Ralph E. Beedle

Enclosure

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<sup>3</sup> Id. at 67203.

## **Nuclear Energy Institute Comments on Petition Requesting Amendment of NRC Regulations and Other Action to Address Fatigue of Personnel at Nuclear Power Plants**

### **I. NRC requirements and responsive industry programs sufficiently address potential fatigue-related issues.**

Each licensee has developed programs to comply with NRC fitness for duty requirements (contained in 10 CFR Part 26), including implementation of a Continuous Behavioral Observation Program (CBOP). Part 26 very clearly requires that licensees establish and implement written policies and procedures to meet general performance objectives and specific fitness for duty requirements. The general performance objective for 10 CFR Part 26 states that fitness for duty programs must provide reasonable assurance that personnel "will perform their tasks in a reliable and trustworthy manner and are not under the influence of any substance, legal or illegal, *or mentally or physically impaired from any cause*, which in any way adversely affects their ability to safely and competently perform their duties."<sup>1</sup> Further, 26.20 states specifically that the "licensee policy should also address other factors that could affect fitness for duty such as mental stress, *fatigue* and illness."

Thus, licensees are required to have programs to assist supervisors in detecting personnel who are not fit to perform their assigned activities. Licensee managers are given training on behaviors and attributes which indicate various bases for questioning a worker's fitness, including use of alcohol or illegal drugs, and behavior indicating stress or fatigue.<sup>2</sup> It is appropriate to continue to rely on the overall fitness for duty programs currently implemented by licensees to monitor fatigue because these programs have been successful. Fatigue is not simply a function of the number of hours worked. It is also based upon an individual's habits away from work, sleep habits and health condition, to name only a few of the potential variables affecting an individual's level of fatigue. Under fitness for duty programs, supervisors are responsible for constantly determining an individual's overall fitness. The petition does not present a legitimate basis for emphasizing fatigue over any other basis for questioning an individual's mental or physical fitness for duty.<sup>3</sup>

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<sup>1</sup> 10 CFR 26.10(a)

<sup>2</sup> 10 CFR 26.22

<sup>3</sup> The petition requests that the NRC revise Form 396 and 10 CFR Part 55 to require self-disclosure and evaluation of known sleep disorders. Currently, 10 CFR Part 55 requires that a license applicant's medical condition and general health shall not adversely affect the performance of assigned operator duties or cause operational errors endangering the public health and safety. This already encompasses detrimental sleep disorders. If an individual had a sleep disorder that would, in the examining physician's judgment, endanger the public health and safety, information regarding this condition would be provided on NRC Form 396.

All licensees have instituted procedures/programs to comply with the agency's working hour policy. Generic Letter 82-12 "Nuclear Power Plant Staff Working Hours," states the Commission's policy and that which licensees should use as guidance in developing their programs:

Licensees of operating plants and applicants for operating licenses shall include in their administrative procedures (required by license conditions) provisions governing required shift staffing and movement of key individuals about the plant. These provisions are required to assure that qualified plant personnel to man the operational shifts are readily available in the event of an abnormal or emergency situation.

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These administrative procedures shall also set forth a policy, the objective of which is to prevent situations where fatigue could reduce the ability of operating personnel to keep the reactor in a safe condition. The controls established should assure that, to the extent practicable, personnel are not assigned to shift duties while in a fatigued condition that could significantly reduce their mental alertness or their decision making ability. The controls shall apply to the plant staff who perform safety related functions (e.g., senior reactor operators, reactor operators, auxiliary operators, health physicists, and key maintenance personnel).

Generic Letter 82-12 clearly sets out the agency's working hour *objectives*--under normal operating conditions, licensees are expected to generally maintain an 8-hour a day, 40-hour a week schedule for plant staff who perform safety related functions. The Generic Letter clearly recognizes that there may be situations that require licensees to use substantial amounts of overtime on a temporary basis. These include unforeseen problems, extended periods of shutdown or refueling, major maintenance or major plant modifications.

The intent of GL 82-12 is to provide appropriate flexibility to enable licensees to accommodate both normal and exigent circumstances without affecting public health and safety. The NRC has chosen not to impose requirements creating inflexible working hour standards precisely because there are occasions when management should be permitted to authorize overtime assignments. For example, licensees generally limit work to the normal 8-12 hour day and 40-hour week. Overtime is to be confined to circumstances where essential work must be done on an accelerated basis (e.g., outages, time-limiting "LCO" actions). The basis used to make a need for overtime determination varies from licensee to licensee, but representative criteria used by licensees are:

- completing work on a problem immediately affecting nuclear or industrial safety
- work affecting critical path during a shutdown
- responding to a limiting condition for operation

- completing work where it is safer to complete than to secure.
- unplanned/unexpected personnel shortages

These criteria are both reasonable and protective of the public health and safety.

As an additional safeguard, and consistent with GL 82-12, licensees have implemented systems/procedures to ensure that senior management exercises careful oversight where overtime in excess of procedural limits may be necessary. In fact, licensees generally require their supervisors to obtain senior management approval of overtime decisions. Although the specifics may vary somewhat from licensee to licensee, in the main, licensees require written authorization by a member of senior management (e.g., plant manager or higher) in order to deviate from overtime guidelines or procedures. Consistent with the principles of GL 82-12, licensees also require a senior manager to review monthly overtime to confirm that workers are not assigned excessive hours. The oversight by senior management provides an important internal check on the implementation of the licensee's own program/procedures. The industry believes management's oversight of the use of overtime may well explain why few events are related to fatigue based on excessive working hours.

Although the demonstrated success of the current regulatory approach is sufficient to warrant rejection of the petition's request for additional regulation, we also note that implementing the proposed working hour limits and, thereby, limiting licensee flexibility to exercise its authority to manage its plant, could, in some circumstances, adversely affect safety. For example, the potential for the strictures of the proposed rule to force the licensee to put the plant through a shutdown transient rather than exceeding the overtime limits for one or two key maintenance staff. Also, the proposed rule could result in many more turnovers and disruptions of teams working together, which could, in turn, lead to increases in errors causing events.

In sum, the NRC has adequately addressed potential fatigue issues as part of its broader fitness for duty rules. Further, licensee programs implementing the guidance contained in GL 82-12 ensure that, under normal operations, licensees limit overtime. As is appropriate, licensees are permitted some flexibility for overtime for unusual circumstances and for relatively short periods with greater worker demands. No evidence has been cited that suggests that any further NRC or licensee actions are necessary.

## **II. The petition fails to supply credible data demonstrating a fatigue problem with nuclear workers.**

The petition contends that working hour limits should be imposed to minimize personnel fatigue. In support of this contention, the petition makes the unsubstantiated claim that there is a problem in the area of nuclear plant personnel fatigue but that it is not properly reported. This argument simply does not withstand scrutiny. The lack of data regarding fatigue cases does not establish that the NRC or licensees underreport fatigue as a root cause. Rather, the failure to attribute significant events to fatigue can be

plainly explained. As noted above, the fitness for duty and continuous behavioral observations programs require supervisors to monitor the workforce for fatigue and other fitness related problems. The relatively stringent overtime criteria used by licensees also should be credited in this regard. Thus, potential problems may be *avoided* because regulatory requirements and implementation of GL 82-12 have performed their intended function.

Petitioner also argues that failing to credit fatigue as a root cause of certain events is of increased significance because the NRC will be "reducing its inspection efforts at nuclear plants."<sup>4</sup> This assumption plainly is incorrect. Over the past decade, NRC has performed an average of approximately 2,350 hours of core inspection on two unit sites. Under the new program, projected average baseline inspections are expected to consume approximately 2,300 hours. The actual differential in the pilot program baseline inspection was 47 hours--less than a 2 percent decrease.

The petition also claims additional regulation of working hours is needed because the transition to a competitive electricity market will motivate nuclear licensees to so reduce staffing that excessive amounts of overtime will be required of the remaining workers. While certainly licensees are making efforts to operate more efficiently, they are also well aware of the need to continue to operate at high levels of safety performance and reliably in order to achieve economic gain. In fact, nuclear power plants have responded to competition, in part, by enhancing plant performance. For example, the nuclear industry overall has increased its output (through September 1999) by 9.4 percent over the same period in 1998. The petitioner simply misapprehends the impact on nuclear licensees of moving to a competitive market. Given that licensees can only derive economic benefit from their nuclear plants when they are operated safely and reliably, there is a great incentive to, among other things, maintain staffing at sufficient levels and develop reasonable work schedules. By doing so, licensees promote productivity among their workers and ensure public health and safety.

The petition states that fatigue causes inattention to detail, increased risk-taking and poor work practices.<sup>5</sup> The variables that affect worker performance often make it exceedingly difficult to determine the precise root cause of an inadequately performed task or questionable decision. Yet, the petitioner reaches its conclusion regarding fatigue without mentioning the host of other reasons that may contribute to inattention to detail, increased risk-taking and poor work practices. As a minimum, other reasons could be distractions based on personal issues, interruptions occurring while a job is being performed, and even mild health problems such as a cold or allergies. Interestingly, the petition later admits that there "are certainly other causes" for the occurrences cited by the NRC in its Human Factors information data base, but nevertheless, and without any supporting data, concludes that "fatigue most probably played a role in a respectable percentage" of these occurrences.<sup>6</sup> The imposition of strict limits on working hours

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<sup>4</sup> 64 Fed. Reg. at 67203.

<sup>5</sup> Id.

<sup>6</sup> Id.

would not address the licensee's inability to control an individual's activities outside the work environment, including whether workers obtain sufficient rest/sleep.

Petitioner's only basis for its conclusion is a comparison between reported fatigue related events cited by the National Transportation Safety Board and the NRC. It is not appropriate to assume that the fatigue experienced by truck drivers, who operate in a sedentary, isolated environment, is relevant to nuclear operators, who are stimulated by other operators and various tasks that must be performed throughout the shift. In addition, to the extent petitioner implicitly focuses on the night shift, we note that individual plant data on human performance events indicate that the night shift does not produce a greater number of errors or that the errors that occur are due to fatigue. Plant data indicate that, where errors are made, they tend to be during the day shift because typically there are more activities underway.

Finally, an evaluation of industry performance data refutes the petitioner's argument that this rule is necessary to prevent fatigued personnel from performing safety related functions. In fact, the data on industry performance demonstrate that there have been fewer events in total, and safety and economic performance has improved overall. We note that the results of a recent NRC study based on operating experience indicate that "combined initiating event frequencies for all initiators calculated from the 1987-1995 experience are lower than frequencies used in NUREG 11-50, Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants and IPEs *by a factor of five and four respectively.*" The decrease in initiating events, a direct indicator of the appropriateness of operator action, would not have occurred if licensed reactor operators routinely suffered from fatigue or other impairments which would affect their ability to safely perform their duties. Even more telling is the statistic related to the rate at which events directly affected by operator action have been reduced:

The overall initiating event frequency decreased by a factor of two to three during the nine year span. Most risk-significant initiator frequencies (such as total loss of feedwater flow, loss of instrument or control air, inadvertent closure of all main steam isolation valves (MSIVs) and total loss of condenser heat sink for BWRs) decreased at a faster rate than the overall initiating event frequency.<sup>7</sup>

Thus, the NRC's own data demonstrate that the number of initiating events has been reduced considerably and that events are far less safety significant. Neither statistic could be achieved if operators or other personnel carrying out safety related tasks were routinely in a fatigued or otherwise impaired state. INPO data also support this conclusion.

### **III. NRC has ample regulatory authority to ensure licensees appropriately handle potential nuclear workforce fatigue.**

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<sup>7</sup> NUREG/CR 5750, "Rates of Initiating Events at U.S. Nuclear Power Plants: 1987-1995," February 1999.

The NRC has ample authority to address potential fitness for duty issues including fatigue. Under 10 CFR 26.20(f), "[t]he Commission may at any time review the licensee's written policy and procedures to assure that they meet the performance objectives of this part." Many plants have included their procedures implementing the guidance in GL 82-12 in their technical specifications. The NRC has the authority to take enforcement action to require a licensee to comply with its technical specifications, thereby providing confidence that workers are not impaired from fatigue based on excessive working hours. Where licensees have included overtime guidelines (consistent) with GL 82-12 in their administrative procedures, NRC also retains regulatory authority to address potential fatigue issues it detects.

#### **IV. The proposed rule would not meet the requirements of 10 CFR 50.109, *Backfit*.**

In promulgating any regulation, the NRC must comply with 10 CFR 50.109. If the exceptions to the backfit rule<sup>8</sup> are not met, the proposed rulemaking must demonstrate that working hour limitations will achieve a substantial increase in the overall protection of the public health and safety *and* that the direct and indirect costs of implementation are justified in view of the increased protection.

Without a strong showing that fatigue is a root cause or even substantial contributing factor to the limited number of significant events that have occurred over the past decade, the first prong of the backfit test cannot be met. That is, no demonstration has been made to indicate a safety significant problem with the current regulatory scheme. If the current regulatory scheme adequately ensures plant personnel are not being subjected to excessive overtime, it is axiomatic that no substantial increase in public health and safety would be derived from the proposed working hour limits.

Finally, the complexity of the proposal and the burdensome nature of its implementation mean that the rulemaking would not satisfy the second prong of 10 CFR 50.109. Without a substantial increase in public health and safety, no additional costs can be justified.

#### **V. Conclusion**

For the aforementioned reasons, the petition for rulemaking should be denied.

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<sup>8</sup> 10 CFR 50.109(a)(4).